a deposit which seemed identical with that forming in the pool, the ripple-marks being represented by undulations of the laminae. A remarkable feature of the section was the coincidence of the ripples through a vertical space of about eighteen inches. All the laminae were inflected in the same way, so that the corresponding parts of the undulations fell in the same verticals, as illustrated in fig. 1.

It occurred to me, that there might be in this feature something analogous to the assumption of stable

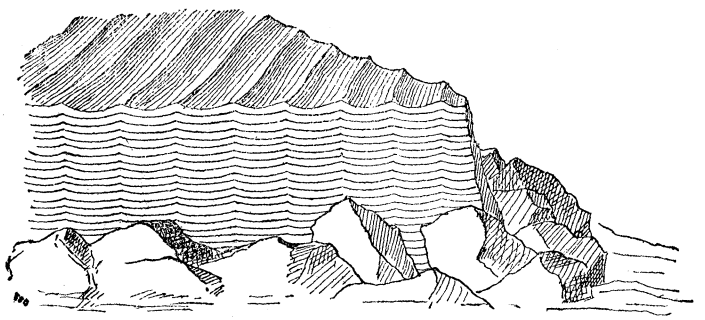


FIG. 1.

figures by free particles on the surface of a vibrating plate, and that the development of this idea might lead to a better theory of the origin of ripple-marks. The common theory, which makes the ripple-mark the homologue of the sand-dune, implies a forward movement of the ripple in the direction of the water-current, and is manifestly inapplicable to the phenomenon just described. I am disposed to doubt its applicability even to ripple-marks produced by currents; for there is a certain class of these, intimately related to small obstructions, which are certainly as stationary and constant as the water-waves on the rapid of a stream.

The analogy of ripple-marks to vibrations in elastic bodies is further illustrated by variations in the forms of the ripples, and by the combination of sets of ripples. The other figures show in profile four forms of ripple observed on upper surfaces of triassic sandstone in south-western Utah. They were carefully drawn from hand specimens. Figs. 2 and 3 are the prevalent forms. In fig. 3 the crest is acute, and the broadly curved trough is midway between the crests. In fig. 2 the crest and trough are moderately acute, and the trough is nearer to one crest than to the other. In fig. 4 the crest is broadly curved, and the trough is less so. In fig. 5 each ripple has a subsidiary crest upon one slope. The resemblance of this last to certain phonographic curves suggests itself at once. In other specimens two systems of ripples co-exist, intersecting at various angles; and the fact that this relation was observed repeatedly, leads me to think that the two sets were synchronously formed. If synchronously formed, there is something in their production analogous to the co-existence of independent and diverse vibrations in elastic bodies.

I do not venture to assert that the correspondences here pointed out are more than superficial analogies, but they suggest a line of investigation which should be fruitful. Such investigation I had intended to undertake, and the accompanying figures were engraved in pursuance of this intention; but, having found myself for some years unable to pursue the subject, I despair of commanding the necessary time and facilities, and avail myself of this opportunity to communicate my observations to the scientific public, in the hope that they may assist in the elucidation of the subject by another.

G. K. GILBERT.

The 'Batrachichthys.'

The publication of the *Archivos do museu nacional* of Brazil began in Rio de Janeiro in 1876. In the second issue, that for the second and third trimesters of 1876, the director of the section of zoölogy and comparative anatomy in the museum published a descrip-

FIG. 2. — Natural size.

FIG. 3. — Two-thirds natural size.

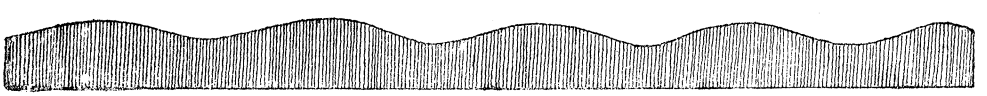


FIG. 4. — Natural size.

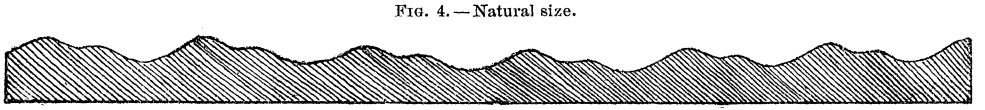


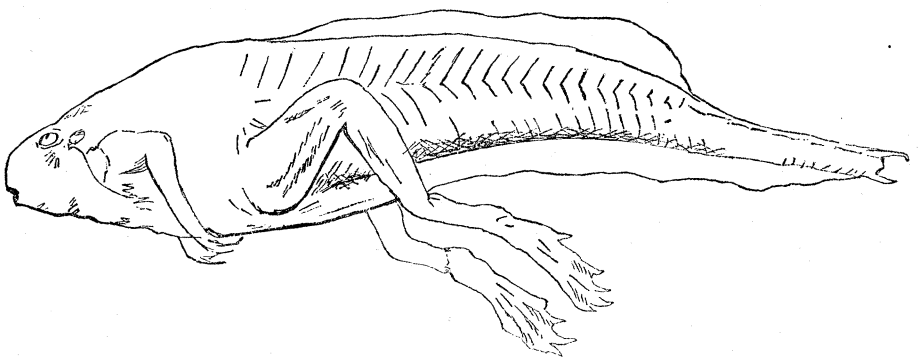
FIG. 5. — Natural size.

tion of what he denominated 'an extremely curious little animal called Batrachichthys' The author evidently believed he had found a 'missing link,' and, as it were, he laid his prize at the feet of Darwin, Haeckel, and Martius with the greatest solemnity.

Although the name of Prof. C. F. Hartt appears as that of one of the editors of the archivos at the time (he resigned shortly after the publication of this article), it is due his memory to say that he objected to the publication of the article referred to, and did all in his power to prevent it, well aware that it would bring ridicule upon the editors and upon the national Brazilian museum, of which he was a director. Notwithstanding Professor Hartt's protestations, the description appeared, accompanied by a plate, from which the accompanying figure is copied.

Mr. S. W. Garman afterwards called attention to the absurdity of making a new genus of this animal, which he shows to be an undeveloped form of a species of Pseudis (*American naturalist*, October, 1877).

More recently this 'extremely curious little animal' has come to the surface again, this time in the French academy. Especial attention was called, in that body, to the first volumes of the Brazilian archivos; and this description of 'a curious batrachian' was spoken of as 'a valuable essay' and 'particularly



deserving attention' (*Pop. sc. monthly*, January, 1884, p. 428).

Agreeing with Professor Hartt in regard to its being nothing more than an unusual tadpole, I was anxious to obtain specimens of the animal in the various stages of its development, and thus make an ocular demonstration of the correctness of our opinions.

My work upon the Imperial geological survey, and later other duties, made it necessary for me to travel in almost every part of Brazil, and in some parts of the Argentine Republic and Paraguay; but nowhere could I find or hear of any such animal as that described in the archivos. Along the Paraguay River, which I traversed from its mouth to its source, I made especial effort to find it; for the specimen figured was said to have come from Paraguay. At length, during a trip made in 1882–83 to the interior of the province of Pernambuco in Brazil, I was so fortunate as to obtain a number of good living specimens; and it goes without saying, that they showed the Batrachichthys to be a mere tadpole. They were taken in an artificial pond near the village of Bonito, toward the end of January, 1883; being found in all stages of development from the tadpole to the full-grown frog, although the very young tadpole could not be had on account of the lateness of the season.

About Bonito these tadpoles are called *cacotes*. They are not uncommon in ditches and ponds, and sometimes occur in such numbers as to seriously interfere with fishing with the net. The full-grown frogs are called *sapos verdes* (green frogs). They are said to live in the weeds and rushes about the margins of the ponds; and, when disturbed, they jump into the water. In regard to these popular names, it should be remarked, however, that they are too general to lead one to suppose that they are applied to this species of frog alone throughout Brazil.

The specimens collected by me are now deposited with Professor Wilder at Cornell university.

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THE GREELY SEARCH.

THE report of the board called to consider the plans of the relief expedition has been printed, and its principal features have been made public through the daily press. Two vessels have been purchased which there is every reason to believe are well suited for the work; and through the graceful courtesy and generosity of the British government, the Alert, well known as the advance ship of the Nares expedition of 1875–76, has been put at the disposition of the United States, without money and without price. A more timely and felicitous service could hardly be rendered; and the sentiment of the country in regard to it is well expressed in the communication of the 21st ultimo to congress from the president and secretary of state.

The position of affairs is about as follows: the Greely party were landed in August, 1881, at Discovery Harbor, with rations equivalent to supplies for three years on the basis used in the U. S. army; with beans, sugar, coffee, canned goods, and antiscorbutics, not embraced in the regular official ration, to the extent, as alleged, of about one year's additional provisions. Beside this, Lieut. Greely reported that about three months' supplies of fresh musk-ox meat had been killed before the departure of the returning vessel. It must be remembered, however, that the demand of human nature for food in these regions is greater than in more temperate climates; and the extra